

## **SOFIA Science Lunch Talk**

Date: Monday May 17, 2004

Speaker: Scott Sanford, NASA Ames Astrophysics Branch

Title: The STARDUST Spacecraft's Encounter with Comet Wild 2

Abstract:

On January 2, 2004, the STARDUST spacecraft made the closest ever flyby (236 km) of the nucleus of a comet - Comet Wild 2. During the flyby the spacecraft collected samples of dust from the coma of the comet. These samples will be returned to Earth on January 15, 2006. After a brief preliminary examination to establish the nature of the returned samples, they will be made available to the general scientific community for study.

In addition to its aerogel dust collector, the STARDUST spacecraft was also equipped with a number of instruments that made in situ measurements of the comet during the flyby. These included several dust impact monitors, a mass spectrometer, and a camera. In addition, the spacecraft's communication system was used to place dynamical constraints on the mass of the nucleus and the number of impacts the spacecraft had with large particles. The data taken by these instruments indicate that the spacecraft successfully captured coma samples. These instruments, particularly the camera, also demonstrated that Wild 2 is unlike any other object in the Solar System previously visited by a spacecraft.

During my talk I will discuss the scientific goals of the STARDUST mission and provide an overview of its design and flight to date. I will then end with a description of the exciting data returned by the spacecraft during the recent encounter with Wild 2 and discuss what these data tell us about the nature of comets. It will probably come as no surprise that the encounter data raise as many (or more) new questions as they answer old ones.